N60200.AR.003978
NAS CECIL FIELD, FL
5090.3a

FINAL RECORD OF DECISION FOR OPERABLE UNIT 12 (OU 12) SITE 32 DEFENSE REUTILIZATION AND MARKETING OFFICE ASPHALT STORAGE YARD NAS CECIL FIELD FL

9/29/2004

TETRA TECH NUS INC

Record Of Decision
Operable Unit 12, Site 32
DRMO Asphalt Storage Yard

Naval Air Station
Cecil Field
Jacksonville, Florida

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888

Contract Task Order 0226

September 2004

080309/P

RECORD OF DECISION
OPERABLE UNIT 12, SITE 32
DRMO ASPHALT STORAGE YARD

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220

CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0226

SEPTEMBER 2004

PREPARED UNDER THE SUPERVISION OF:

MARK SPERANZA, P.E.
TASK ORDER MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

APPROVED FOR SUBMITTAL BY:

DEBRA M. HUMBERT
PROGRAM MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

This document that describes the Record of Decision for Operable Unit 12, Site 32, DRMO Asphalt Storage Yard at Naval Air Station Cecil Field, Jacksonville, Florida, has been prepared under the direction of a Florida-registered professional engineer. The work and professional opinions rendered in this report were conducted or developed in accordance with commonly accepted procedures consistent with applicable standards of practice.

Mark P. Speranza

Mark P. Speranza, P.E.
Professional Engineer No. PE0050304

Date: 9/29/04

Mark P. Speranza

TABLE OF CONTENTS

SECTION **PAGE NO.**

CERTIFICATION ..... **iii**

ACRONYMS ..... **vii**

1.0 DECLARATION OF THE RECORD OF DECISION **1-1**
1.1 SITE NAME AND LOCATION 1-1
1.2 STATEMENT OF BASIS AND PURPOSE 1-1
1.3 ASSESSMENT OF THE SITE 1-1
1.4 DESCRIPTION OF THE SELECTED REMEDY 1-1
1.5 STATUTORY DETERMINATIONS 1-2
1.6 DATA CERTIFICATION CHECKLIST 1-3
1.7 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF REMEDY 1-3

2.0 DECISION SUMMARY **2-1**
2.1 SITE NAME, LOCATION, AND DESCRIPTION 2-1
2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES 2-1
2.2.1 Site 32 History 2-2
2.2.2 Site Investigations 2-2
2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION 2-4
2.4 SCOPE AND ROLE OF OPERABLE UNIT 2-4
2.5 SUMMARY OF SITE CHARACTERISTICS 2-5
2.5.1 Geology and Hydrogeology 2-5
2.5.2 Nature and Extent of Contamination 2-6
2.5.3 Current and Potential Future Site Uses 2-7
2.6 SUMMARY OF SITE RISKS 2-7
2.6.1 Human Health Risks 2-7
2.6.2 Ecological Risks 2-9
2.7 CLEANUP GOALS 2-10
2.8 DESCRIPTION OF REMEDIAL ALTERNATIVES 2-11
2.8.1 Alternative 1: No Action 2-11
2.8.2 Alternative 2: LUCs and Groundwater Monitoring 2-12
2.8.3 Alternative 3: Excavation and Off-Base Disposal 2-12
2.9 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES 2-13
2.10 SELECTED REMEDY 2-13
2.10.1 Summary of Rationale for Remedy Selection 2-13
2.10.2 Remedy Description 2-14
2.10.3 Summary of Estimated Remedy Costs 2-15
2.10.4 Expected Outcomes of the Selected Remedy 2-16
2.11 STATUTORY DETERMINATIONS 2-16
2.11.1 Protection of Human Health and the Environment 2-16
2.11.2 Compliance with Applicable or Relevant and Appropriate Requirements 2-17
2.11.3 Other Criteria, Advisories, or Guidance To Be Considered for This Remedial Action 2-18
2.11.4 Cost-Effectiveness 2-18
2.11.5 Utilization of Permanent Solutions and Alternative Treatment Technologies 2-19
2.11.6 Preference for Treatment as a Principal Element 2-19
2.11.7 Five-Year Review Requirement 2-19
2.12 DOCUMENTATION OF SIGNIFICANT CHANGES 2-19

TABLE OF CONTENTS (Continued)

SECTION **PAGE NO.**

REFERENCES **R-1**

APPENDICES

A RESPONSIVENESS SUMMARY
B ESTIMATED COSTS OF SELECTED REMEDY

TABLES

NUMBER

1-1 Data Certification Checklist
2-1 Summary of Pre-IRA Analytical Data for Soil In Unpaved Areas
2-2 Summary of Analytical Data for Soil Beneath the Asphalt Pavement
2-3 Summary of Positive Detections in Groundwater
2-4 Summary of Post-IRA Soil Analytical Data
2-5 Explanation of Detailed Analysis Criteria
2-6 Summary of Comparative Analysis of Soil Remedial Action Alternatives
2-7 Federal Chemical-Specific ARARs for Selected Remedy
2-8 State Chemical-Specific ARARs for Selected Remedy
2-9 Federal Location-Specific ARARs for Selected Remedy
2-10 State Location-Specific ARARs for Selected Remedy
2-11 Federal Action-Specific ARARs for Selected Remedy
2-12 State Action-Specific ARARs for Selected Remedy

FIGURES

NUMBER

2-1 General Location Map
2-2 General Arrangement
2-3 Site Layout Map
2-4 Post-Removal Action Exceedances for Industrial Land Use Scenario
2-5 Block Flow Diagram, Selected Remedy

ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
AOI	Area of Interest
ARAR	Applicable or relevant and appropriate requirement
BaP	Benzo(a)pyrene
BaPEq	BaP equivalent
BCT	BRAC Cleanup Team
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH2M Hill	CH2M Hill Constructors, Inc.
COC	Chemical of concern
cPAH	Carcinogenic PAH
CSF	Cancer Slope Factor
DRMO	Defense Reutilization and Marketing Office
EBS	Environmental Baseline Survey
EC	Engineering Control
EE	Envirodyne Engineers
EE/CA	Engineering Evaluation/Cost Analysis
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FFA	Federal Facility Agreement
FS	Feasibility Study
GCTL	Groundwater Cleanup Target Level
G&M	Geraghty & Miller
HLA	Harding Lawson Associates
HSWA	Hazardous and Solid Waste Amendments
IAS	Initial Assessment Study
IBDS	Inorganic Background Data Set
IC	Institutional Control
IR	Installation Restoration
IRA	Interim Removal Action
JEDC	Jacksonville Economic Development Commission
LTTD	Low-temperature thermal desorption
LUC	Land use control

MCL	Maximum Contaminant Level
NAS	Naval Air Station
Navy	United States Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NFF	North Fuel Farm
NPL	National Priorities List
NPW	Net present worth
O&M	Operating and maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OWSER	Office of Solid Waste and Emergency Response
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PPE	Personal Protective Equipment
PSC	Potential Source of Contamination
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SAO	Sampling and Analysis Outline
SAR	Sampling and Analysis Report
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SDWA	Safe Drinking Water Act
SMCL	Secondary MCL
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TBC	To Be Considered (criterion)
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper confidence level
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound

1.0 DECLARATION OF THE RECORD OF DECISION

1.1 SITE NAME AND LOCATION

Operable Unit (OU) 12, Site 32 consists of the contaminated soil in both the paved and unpaved areas of the Defense Reutilization and Marketing Office (DRMO) Asphalt Storage Yard at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida [United States Environmental Protection Agency (U.S. EPA) ID FL5 170 022 474]. Site 32 is located in the central portion of the former Main Base.

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedy for contaminated soil at OU 12, Site 32 at the former NAS Cecil Field. The selected remedial actions were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) [40 Code of Federal Regulations (CFR) §300]. This decision document was prepared in accordance with U.S. EPA decision document guidance (U.S. EPA, 1999). This decision is based on the Administrative Record for the site. The United States Department of the Navy (Navy) and U.S. EPA Region 4 issue this ROD (jointly). The Florida Department of Environmental Protection (FDEP) concurs with the selected remedy.

1.3 ASSESSMENT OF THE SITE

The response actions selected in this ROD are necessary to protect the public health, welfare, or the environment from actual or threatened releases of hazardous substances into the environment or of pollutants or contaminants from this site that may present an imminent and substantial endangerment to public health or welfare.

1.4 DESCRIPTION OF THE SELECTED REMEDY

OU 12, Site 32 is part of a comprehensive environmental investigation and cleanup currently being performed at NAS Cecil Field under the CERCLA program. This ROD addresses only OU 12, Site 32. The selected remedy eliminates unacceptable exposures to chemicals of concern (COCs) in soil. The selected remedy for OU 12, Site 32 includes the use of an existing asphalt cap, monitoring of groundwater, and land use controls (LUCs) that will limit exposure to soil and prevent any residential reuse activities. The selected remedy was determined based upon an evaluation of site conditions, site-related risks, future land use, applicable or relevant and appropriate requirements (ARARs), and Remedial Action Objectives (RAOs).

The major components of the selected remedy are as follows:

- An existing asphalt cap will be utilized as an Engineering Control (EC) to prevent exposure to contaminated soils beneath the asphalt.

- LUCs, including Institutional Controls (ICs) and deed restrictions, will be implemented to prevent residential development of Site 32 and to require that proper maintenance of the asphalt pavement is provided by subsequent property owner(s). In addition, excavation of the asphalt cover or any unpaved areas of the site with soil contamination in excess of health-based levels, without prior written consent by the Navy, U.S. EPA, and FDEP, will be prohibited.

- Long-term monitoring will be performed by collecting and analyzing groundwater samples to verify that no unacceptable contaminant migration is occurring.

- Site conditions will be reviewed every 5 years. If monitoring and LUCs are shown to be insufficient to meet the cleanup goals and RAOs, another remedial approach will be evaluated and may be implemented.

The Navy shall prepare in accordance with U.S. EPA Guidance and submit to the U.S. EPA and FDEP, a LUC Remedial Design as well as other post-ROD documents as specified in the Federal Facility Agreement (FFA) for the Former NAS Cecil Field dated October 23, 1990.

1.5 STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, is cost effective, and complies with Federal and State requirements that are legally applicable or relevant and appropriate to the selected remedial action. The nature of the selected remedy for OU 12, Site 32 is such that ARARs could eventually be met through natural attenuation of the soil. The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a practicable manner at this site. Of those alternatives that are protective of human health and the environment and comply with ARARs, the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment. Although the selected remedy does not provide for treatment as a principal element, reduction of soil contaminant concentrations is expected over time due to adsorption processes. Because this remedy would result in soil with contaminant concentrations greater than health-based levels remaining on site, a review will be conducted every 5 years to ensure that the remedy continues to provide adequate protection of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The information required to be included in the ROD is summarized on Table 1-1. These data are presented in Section 2.0: Decision Summary of this ROD. Additional information, if required, can be found in the Administrative Record for OU 12, Site 32.

1.7 SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

Jeffrey G. Meyers, P.E., CHMM
Base Realignment and Closure
Environmental Coordinator

17 June 2004
Date

Winston A. Smith
Director
Waste Management Division
U.S. EPA Region 4

9-29-04
Date

TABLE 1-1

DATA CERTIFICATION CHECKLIST
OU 12, SITE 32 RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Information	ROD Reference
Chemicals of Concern (COCs) and their concentrations	Section 2.5.2, Pages 2-5 and 2-6 Tables 2-1, 2-2, 2-3, and 2-4 Figure 2-4
Baseline risk represented by the COCs	Section 2.6 Pages 2-7, 2-8, 2-9, and 2-10
Cleanup Goals established for the COCs	Section 2.7 Page 2-10
Disposition of source materials constituting principal threat	Section 2.2.2, 4th bullet Page 2-3
Current and reasonably anticipated future land and groundwater use scenarios used for risk assessment	Section 2.5.3 Page 2-7
Potential land and groundwater uses available at the site as a result of the selected remedy	Section 2.10.4 Pages 2-15 and 2-16
Estimated capital, operating and maintenance (O&M), and total present worth (NPW) costs of selected remedy. Discount rate used and timeframe over which these costs are projected	Section 2.10.3 Page 2-15 Appendix B
Key factors that lead to the selection of the remedy	Section 2.10.1 Page 2-13

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

OU 12, Site 32 is situated within the boundaries of the former NAS Cecil Field (U.S. EPA ID FL5 170 022 474), which is located 14 miles southwest of Jacksonville, Florida (See Figure 2-1). The majority of Cecil Field is located within Duval County, but the southernmost part of the Facility is located in Clay County. NAS Cecil Field was established in 1941 and provided facilities, services, and material support for the operation and maintenance of naval weapons, aircraft, and other units of the operation forces as designated by the Chief of Naval Operations. Since the closure of NAS Cecil Field in September 1999, most of the Facility has been transferred to the Jacksonville Port Authority (now Jacksonville Airport Authority) and the City of Jacksonville. According to the City's reuse plan, Cecil Field will have multiple uses but will be used primarily for industrial and/or commercial activities.

OU 12, Site 32 consists of the contaminated soil identified at the DRMO Asphalt Storage Yard at the former NAS Cecil Field. As shown in Figures 2-1 and 2-2, Site 32 is located in the Main Base Area of NAS Cecil Field, just north of the western end of Crossover Street (formerly 2nd Street) and west of New World Avenue (formerly "D" Avenue) in the area north of the east-west flightline. As shown on Figure 2-3, the site includes Buildings 325 and 335 and adjacent areas. The portion of the site in the vicinity of Building 325 (approximately 1.4 acres) is paved and includes a fenced storage area, and the remaining portion of the 2.3-acre site, located east of the fenced storage area and north of Building 335, is unpaved, and includes a stormwater retention pond. Site 32 is bordered by paved parking lots to the north and south, by another DRMO Storage Yard to the west, and by Building 68 to the east (Figure 2-3). The site is an industrial area, and the reuse plan identifies that this area will continue to be used in that manner.

Site 32, known as the Hazardous Material Warehouse Storage Area, was used for initial storage and warehousing of materials as they arrived at the Base. Historical usage of the property for temporary storage of hazardous materials and first-hand accounts of leaking and poorly maintained drums has been documented.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The first environmental studies for the investigation of waste handling and/or disposal sites at NAS Cecil Field were conducted between 1983 (G&M, 1983) and 1985 (G&M, 1985). These studies were followed in 1985 by an Initial Assessment Study (IAS) (EE, 1985). A Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) was completed in 1988.

NAS Cecil Field was placed on the National Priorities List (NPL) by the U.S. EPA in December 1989. An FFA for NAS Cecil Field was signed by FDEP, U.S. EPA, and the Navy in 1990. Following the listing of NAS Cecil Field on the NPL and the signing of the FFA, remedial response activities at the Facility have been completed under CERCLA authority. OU 12 is one of 12 OUs that have been identified. A Hazardous and Solid Waste Amendments (HSWA) permit was issued on October 13, 1996. The HSWA permit was renewed on August 25, 2000 and is still in effect.

2.2.1 Site 32 History

Buildings 325 and 335 and the open storage area adjacent to these buildings were used for the initial storage and warehousing of hazardous materials as they arrived at the Base. Following NAS Cecil Field closure in September 1999 and transfer of the Base to civilian ownership, the two buildings and the open storage area, collectively referred to as Site 32, were deactivated.

Site 32 was referred to in the Base Realignment and Closure (BRAC) NAS Cecil Field Environmental Baseline Survey (EBS) (ABB-ES, 1994) as Area of Interest (AOI) 32. The site was color-coded grey in the EBS because of hazardous material storage and reported hazardous material releases at the site. Based on soil contamination detected during a field investigation conducted at AOI 32 in 1996 by ABB Environmental Services, Inc. (ABB-ES) (ABB-ES, 1996), the site was renamed Potential Source of Contamination (PSC) 32 in February 1999. Between May 1999 and April 2000, Tetra Tech NUS, Inc. (TtNUS) conducted field investigations at PSC 32 to delineate the extent of surface and subsurface soil contamination (TtNUS, 1999b and 2000a). In May, 2001, following soil excavation activities, the BRAC Cleanup Team (BCT) redesignated the area as Installation Restoration (IR) Site 32 within OU 12.

2.2.2 Site Investigations

The following investigations and studies have been conducted in and around Site 32:

- As part of the Sampling and Analysis Outline (SAO) for AOIs 32 and 33 (ABB-ES, 1995), a Phase II investigation was proposed for AOI 32 to assess the presence or absence of contamination in surface soil, surface water, sediment, and groundwater. A full Contract Laboratory Program suite of Target Compound List (TCL) organics [including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs)] and Target Analyte List (TAL) inorganics was recommended.

- As part of the Phase II investigation recommended in the SAO and associated with the Sampling and Analysis Report (SAR), one groundwater sample, one sediment sample, and five surface soil samples were collected and analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, and TAL

inorganics (ABB-ES, 1996). The groundwater sample was collected from a well installed in the west-central section of AOI 32. The sediment sample was collected from the stormwater retention basin north of Building 335, and the five surface soil samples were collected at locations near the four corners and the center of the paved area surrounding Building 325. Aluminum, iron, and manganese were detected in groundwater samples at concentrations greater than Secondary Maximum Contaminant Levels (SMCLs); however, these concentrations were less than Inorganic Background Data Set (IBDS) levels (HLA, 1998), and no groundwater pathway to human or ecological receptors was identified at AOI 32. Chromium, lead, manganese, selenium, tin, and vanadium were detected at concentrations in excess of human health screening criteria in surface soil samples beneath the asphalt paved area. No hexavalent chromium was detected in the sample with the highest total chromium concentration, and no exposure pathways to soil beneath the asphalt were identified for human or ecological receptors. No human health or ecological screening criteria were exceeded in the sediment collected from the stormwater retention basin. Based on the information obtained from the SAR Phase II investigation, it was concluded that concentrations of analytes detected in surface soil in the study area may represent a hazard to human health or the environment if deterioration of the asphalt pavement results in an exposure pathway.

- Between May 1999 and April 2000, seven soil sampling and analysis events were conducted at PSC 32 to delineate the extent of polynuclear aromatic hydrocarbon (PAH) and inorganic contamination in surface and subsurface soil. Thirty-six surface soil samples and three subsurface soil samples were collected during the seven events. Typically, samples were analyzed for PAHs and Toxicity Characteristic Leaching Procedure (TCLP) and TAL inorganics. The results were used to delineate soil contamination for excavation and disposal (TtNUS, 1999b and 2000a).

- In May 2000, an Action Memorandum for PSC 32 was prepared to identify the need for an Interim Removal Action (IRA) and to estimate the associated costs (TtNUS, 2000b). In August 2000, this IRA for the excavation and disposal of 78 cubic yards (141 tons) of soil adjacent to Building 335 in the unpaved section of the site was conducted to address potential exposures and hazardous substances that posed a threat of release and to facilitate the reuse planned for this area (CH2M Hill, 2001).

- Between May 2001 and August 2002 an Engineering Evaluation/Cost Analysis (EE/CA) was performed. Based on the results of previous investigations, RAOs were developed, soil COCs were identified, and cleanup goals were established for the unpaved area of the site. Remedial alternatives for soil were then assembled, analyzed, and compared, and a preferred alternative was recommended (TtNUS, 2002b).

- In June 2003, a Proposed Plan (TtNUS, 2003) was prepared based on the findings of the EE/CA. This Proposed Plan identified the use of an existing asphalt cap, implementation of LUCs, and monitoring of groundwater as the proposed remedial alternative for the Site 32 soil. The Proposed Plan also presented a rationale for the selection of the proposed remedy.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Public notices of the availability of the Proposed Plan (TtNUS, 2003) were placed in the Metro section of the *Florida Times-Union* on September 24, 2003. A 30-day comment period was held from September 24 through October 24, 2003, during which comments were solicited from the community. Public comments and the responses to these comments are presented in the Responsiveness Summary provided in Appendix A.

Documents pertaining to OU 12, Site 32 are available to the public at the Information Repository located at Building 907, 13357 Lake Newman Street, Cecil Commerce Center, Jacksonville, Florida 32252 [Telephone (904) 573-0336]. This ROD will become part of the Administrative Record File [NCP §300.825(a)(2)].

2.4 SCOPE AND ROLE OF OPERABLE UNIT

The environmental concerns at the former NAS Cecil Field are complex. As a result, work at the 24 sites in the IR Program has been organized into 12 OUs. More than 200 other areas have undergone or are undergoing evaluation in the BRAC and petroleum programs.

This ROD is the final action for OU 12, Site 32. Final RODs have been approved for OU 1 through OU 4; OU 5, Site 14; OU 6 through OU 8; OU 9, Sites 36/37; OU 11, and OU 12, Sites 42, 44 and Old Golf Course. A Remedial Investigation (RI), Baseline Risk Assessment (BRA), and Feasibility Study (FS) have also been prepared for OU 5, Site 15, but the FS is currently being re-evaluated. An EE/CA report for OU 9, Site 49 was finalized in February 2002. RI and FS reports were finalized for OU 9, Sites 57 and 58 in August and October 2002, respectively. RI reports for OU 10, Sites 21 and 25 were finalized in October 2001. The FS report for Site 25 was finalized in October 2001 and the FS report for Site 21 was finalized in October 2003. Decision documents are forthcoming for Sites 21, 25, 49, and 57/58.

Investigations at OU 12, Site 32 indicated the presence of soil contamination from past operating practices. This contamination could pose an unacceptable human health risk if residential development occurred at the site or if the asphalt pavement on the western portion of the site is allowed to deteriorate and expose underlying soils. As a result, the following RAOs were established for soil at OU 12, Site 32:

- Prevent unacceptable risk from exposure to soil with concentrations of PAHs greater than FDEP residential Soil Cleanup Target Levels (SCTLs) (FDEP, 1999) and concentrations of inorganics greater than FDEP residential SCTLs and/or IBDS values (HLA, 1998).

- Address the potential risk of migration of organic and inorganic contamination from soil to groundwater from soils with concentrations that exceed FDEP SCTLs for leachability.

The remedy documented in this ROD will achieve these RAOs.

2.5 SUMMARY OF SITE CHARACTERISTICS

Contaminant sources, detected concentrations, fate and transport, contaminated media, and geologic and hydrogeologic conditions of OU 12, Site 32 are discussed in Sections 2.0 of the OU 12, Site 32 EE/CA Report (TtNUS, 2002b). The characteristics for this 2.3-acre site, as described in Section 2.1, are summarized in the following paragraphs.

2.5.1 Geology and Hydrogeology

Site 32 is located near OU 11, Site 45 in the Main Base area of the former NAS Cecil Field. No site-specific subsurface geologic investigation was performed at the DRMO Asphalt Storage Yard; however, the geological and hydrogeological characteristics of the site are assumed to be similar to those described in the RI Report for OU 11, Site 45 (TtNUS, 2001a) as presented below.

Shallow soil to a depth of 6 feet below ground surface (bgs) at Site 45 was composed of approximately 91 percent fine sand and approximately 9 percent silt and clay, with a United Soil Classification System (USCS) classification of SW-SM. Deeper soil to a depth of 37 feet bgs was composed of approximately 98 percent fine sand and 2 percent silt and clay, with a USCS classification of SW. Specific gravity of the soil ranged from 2.58 to 2.63, and porosity ranged from 31.8 to 46.3 percent.

Three main hydrogeologic units underlie the site. These units, in ascending order, are the Floridan aquifer system, the intermediate aquifer system or confining unit, and the surficial aquifer. Depth to groundwater at Site 45, as measured in April 2000, ranged from approximately 7 to 9 feet bgs. The surficial aquifer system in which Site 45 wells are installed is approximately 90 to 100 feet thick at NAS Cecil Field. Based on the water level measurements taken during the RI, groundwater flows to the southeast across the site. This direction of flow is consistent with nearby sites such as Sites 36 and 37. The groundwater gradient at Site 45 is approximately 0.003, similar to the gradients measured at Sites 36 and 37 (0.001 to 0.007), and the horizontal velocity of groundwater flow calculated in the Site 45 RI was approximately 0.08 feet/day or 28 feet/year.

2.5.2 Nature and Extent of Contamination

2.5.2.1 Soil

Tables 2-1 and 2-2 present summaries of soil analytical data from the unpaved areas of the site (collected prior to the IRA) and from beneath the asphalt pavement, respectively. The tables include minimum and maximum detected concentrations, frequencies of detection, and comparisons of the analytical data to the FDEP SCTLs for direct residential exposure, direct industrial exposure, and leachability to groundwater and to site-specific IBDS values. Table 2-1 indicates that only PAHs, including 1-methylnaphthalene, acenaphthene, benzo(a)anthracene, benzo(a)pyrene (BaP), benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected in soil in the unpaved portions of the site, prior to the IRA, at concentrations in excess of FDEP SCTLs for direct residential or industrial exposure or leachability to groundwater.

Table 2-2 indicates that 4-methylphenol, BaP, antimony, arsenic, barium, cadmium, lead, manganese, nickel, selenium, and vanadium were detected in soil beneath the asphalt pavement at concentrations in excess of the FDEP SCTLs for direct residential or industrial exposure, leachability to groundwater, or NAS Cecil Field site-specific IBDS values. Of these nine COCs, only lead and arsenic exceeded the FDEP SCTL for direct industrial exposure. The Phase II investigation determined that concentrations of these contaminants beneath the asphalt pavement at Site 32 could represent a hazard to human health or the environment if extensive enough deterioration of the asphalt pavement would result in an exposure pathway.

Accordingly, PAHs, 4-methylphenol, antimony, arsenic, barium, cadmium, lead, manganese, nickel, selenium, and vanadium were retained as soil COCs for Site 32. Those remaining post-IRA exceedances of industrial or leachability to groundwater SCTLs or site-specific IBDS values for soil are illustrated on Figure 2-4.

2.5.2.2 Groundwater

A groundwater sample was collected from well CEF-1032-01 and analyzed for TCL organics and TAL inorganics during the Phase II investigation. Concentrations of aluminum, iron, and manganese exceeded FDEP GCTLs and U.S. EPA Maximum Contaminant Levels (MCLs) (both secondary criteria) but were less than NAS Cecil Field site-specific IBDS values (ABB-ES, 1996). In addition, no exposure pathways to human or ecological receptors were identified for groundwater, provided that the asphalt pavement is properly maintained. Therefore, there are no COCs for Site 32 groundwater.

Table 2-3 summarizes the groundwater analytical data and compares the results to Federal MCLs, FDEP Groundwater Cleanup Target Levels (GCTLs), and NAS Cecil Field site-specific IBDS values for groundwater.

2.5.2.3 Sediment

Also during the Phase II investigation, one sediment sample was collected from the stormwater retention basin north of Building 335. The sample was collected at a depth of 0 to 6 inches below the water-sediment interface. No human health or ecological screening criteria were exceeded in this sample.

2.5.3 Current and Potential Future Site Uses

The Jacksonville Economic Development Commission (JEDC) Reuse Plan provides for continued industrial and/or commercial uses of the site. Site RAOs support industrial risk exposure; therefore, potential future uses for Site 32 are limited to military, commercial, or industrial land uses.

2.6 SUMMARY OF SITE RISKS

2.6.1 Human Health Risks

During the Phase II investigation, carcinogenic PAHs (cPAHs) were detected in soil in the unpaved area within Site 32 at concentrations in excess of FDEP SCTLs for direct industrial exposure and leachability to groundwater. A statistical evaluation was conducted to determine the areas of soil requiring removal so that the site-wide 95-percent upper confidence level (UCL) of the remaining concentrations of each contaminant was equal to or less than the SCTLs for direct industrial exposure. The results of this statistical evaluation are presented in the Action Memorandum for PSC 32 (TtNUS, 2000b).

The BCT decided that soil samples with BaP concentrations greater than three times the FDEP industrial SCTL of 500 µg/kg would be excavated. Excavation of these soils ensures protection of human health under an industrial land use scenario. Protection of groundwater is ensured because the leachability SCTL for BaP is greater than three times the industrial SCTL for BaP. Some soil samples remaining on site after excavation activities were completed may have concentrations in excess of the industrial SCTL, but the post-excavation exposure concentration over the entire site was determined to be less than the industrial SCTL. If the 95-percent UCL of the mean is less than the industrial SCTL, protection of human health is reasonably ensured.

Because BaP was the principal cPAH detected in the Site 32 soil, the BCT agreed that cPAHs detected in soil at the site should be regarded as a family of compounds and that their concentrations should be expressed in terms of BaP equivalents (BaPEqs). To ensure protection of human health, the post-

excavation exposure concentration of BaPEqs also should be less than the industrial SCTL for BaP. For a given soil sample, a total BaPEq concentration was derived using detected concentrations of individual cPAHs and toxicity equivalent factors (U.S. EPA, 1995). If a cPAH was not detected in a particular sample, a concentration of one-half of the analytical detection limit for that cPAH was used to compute the total BaPEq concentration of that sample.

An IRA was conducted in August 2000 (CH2M Hill, 2001). During this removal action, approximately 78 cubic yards (141 tons) of soil were excavated and disposed off site so that the 95-percent UCL of the residual concentrations of BaPEq in soil was equal to or less than the direct industrial SCTL for BaP. Samples with BaPEq concentrations in excess of 1,500 µg/kg (three times the BaP industrial SCTL of 500 µg/kg) were excavated and disposed in a permitted solid waste disposal facility. The excavated soil was replaced with clean fill from the North Fuel Farm (NFF). BaP was not detected in this soil. Therefore, to calculate the post-excavation exposure concentration for BaP, the removed samples were replaced with a BaP concentration of 19 µg/kg, a value equal to one-half its detection limit in the fill samples. To calculate the post-excavation exposure concentration for BaPEqs, the BaPEq concentrations of removed samples were replaced with a BaPEq concentration of 124 µg/kg, based on data collected from the NFF. The removal of these samples, in combination with other samples that were excavated, resulted in post-IRA concentrations of 279 µg/kg for BaP and 379 µg/kg for BaPEqs, which is less than the industrial SCTL for BaP and corresponds to a post-IRA carcinogenic risk of 7.6×10^{-7} for a site worker. This value is less than both the U.S. EPA carcinogenic risk range of 10^{-4} to 10^{-6} and the FDEP target carcinogenic risk value of 10^{-6}. Therefore, soil in the unpaved portion of the site no longer represents an unacceptable human health risk under an industrial scenario.

Following the removal action, only BaP remained in the Site 32 soil in the unpaved areas at concentrations in excess of the FDEP SCTLs for direct industrial exposure. Table 2-4 summarizes the minimum and maximum detected post-removal action concentrations, arithmetic means of detected concentrations, and 95-percent UCL concentrations for BaP and BaPEqs and compares these post-removal action soil data to the FDEP SCTLs for direct residential exposure, direct industrial exposure, and leachability to groundwater. As can be seen from Table 2-4, although the site-wide 95-percent UCL concentrations of BaP and BaPEqs remaining in the soil in the unpaved area of the site following the removal action are less than the FDEP SCTL for direct industrial exposure, these UCLs still exceed the FDEP SCTL for direct residential exposure.

Concentrations of inorganic contaminants beneath the asphalt pavement exceed FDEP residential and industrial SCTLs. Exceedances of these risk-based criteria result in hazard indices greater than 1.0. These unacceptable noncarcinogenic risks will be mitigated by maintenance of the asphalt pavement as required by LUCs to be implemented at this site as part of the selected remedy. Soil beneath the asphalt

pavement at Site 32 does not represent a human health risk provided that the asphalt cap is adequately maintained.

2.6.2 Ecological Risks

Site 32 is located in a highly developed portion of the former NAS Cecil Field and consists largely of the asphalt storage yard and Buildings 325 and 335. Parking lots, paved streets, and other buildings surround the site. Potential ecological habitat consists of an area of turf grass north of Building 335 and a retention pond. The retention pond is approximately 110 feet in length and 30 feet wide. The northern two-thirds of the pond are normally dry except immediately following rain events. There is no aquatic vegetation in this portion of the pond; instead, it is gravel covered. The southern one-third of the pond is vegetated by a thick growth of cattails. Water in the southern portion of the pond is generally shallow. The turf grass area is utilized by receptors typically found in urban and industrial areas, such as various terrestrial invertebrates, lizards, songbirds, and exotic rodents such as the Norway rat, black rat, and house mouse. Aquatic invertebrates, minnows, reptiles, and amphibians probably utilize the retention pond. Wading birds probably forage occasionally in the pond.

Ecological risks to receptors in the retention pond were previously investigated, and sediment analytes did not exceed ecological screening criteria (ABB-ES, 1996). Therefore, no further investigation of ecological risk associated with the retention pond was conducted.

A drainage ditch (OU 12, Site 44) is located west of the paved DRMO Storage Yard. At its closest point to Site 32, approximately 150 feet from the western edge of the paved yard, the ditch flows north to south. South of the site, the ditch bends to the west and after several hundred feet eventually proceeds past the wastewater treatment plant and into Lake Fretwell. Runoff from the paved storage yard could proceed to the drainage ditch; however, this runoff does not contact the impacted soil beneath the asphalt pavement.

Groundwater beneath the site could enter the ditch during seasonal high water table levels; however, samples collected from two Site 44 monitoring wells located between the paved storage yard and the drainage ditch did not exceed FDEP GCTLs or IBDS values. An extensive ecological risk evaluation was performed on the ditch from the DRMO to the wastewater treatment plant, and the results of this evaluation can be found in the Technical Memorandum for No Further Action for PSC 44 (TtNUS, 2002a).

Post-IRA soil data collected from the unpaved portion of Site 32 indicated that concentrations of several PAHs exceeded Region IV ecological screening values. Those contaminants generally fall into two classes: chemicals for which the exposure route of concern is direct contact and chemicals for which the exposure route of concern is the food chain (U.S. EPA, 2000b). PAHs fall in the first category because they do not biomagnify in the food web, and PAHs present at the concentrations measured at Site 32

would not bioaccumulate. Thus, toxicity through direct contact is the only applicable exposure route for PAHs at the site. Based on the limited terrestrial habitat at Site 32 and on measured PAH concentrations, the potential ecological risks from PAHs at Site 32 are limited to soil invertebrates such as earthworms. Extensive use of the site by larger receptors such as birds and mammals is negligible due to the industrial character of the site.

In summary, Site 32 is located in a highly developed area and consists largely of paved areas and buildings. Ecological habitat is restricted to turf grass and an on-site shallow retention pond, most of which is normally dry. Chemical concentrations in sediment from the retention pond did not exceed ecological screening criteria. Surface soil contamination is limited to an area of approximately 100 feet by 40 feet in which PAH concentrations exceed ecological screening criteria in some samples. With the above factors in mind, ecological risk appears to be negligible.

2.7 CLEANUP GOALS

The COCs identified for the Site 32 soil are PAHs in the unpaved area and 4-methylphenol and inorganics in the paved areas of the site.

A cleanup goal is the target concentration to which a COC must be reduced within a particular medium of concern to achieve one or more of the established RAOs. Cleanup goals are established to ensure that COC concentration levels left on site are protective of human and ecological receptors.

For Site 32, soil cleanup goals for PAHs and inorganics were determined based on the following criteria:

- Protection of human health from direct exposure to contaminated soil in excess of industrial criteria
- Compliance with ARARs and, to the extent possible, To Be Considered (TBC) criteria

The following COCs were established for Site 32 soil:

COC	SCTL[1] (µg/kg)		Cleanup Goal (µg/kg)	Applicable Area
	Industrial Exposure	Leachability to Groundwater		
BaP	500	8,000	500	Unpaved
BaPEq	500	8,000	500	Unpaved
4-Methylphenol	3,000,000	30	30	Paved
Antimony	240,000	5,000	9,440[2]	Paved
Arsenic	3,700	29,000	3,700	Paved
Barium	87,000,000	1,600,000	1,600,000	Paved
Cadmium	1,300,000	8,000	8,000	Paved

COC	SCTL[1] (µg/kg)		Cleanup Goal (µg/kg)	Applicable Area
	Industrial Exposure	Leachability to Groundwater		
Lead	920,000	NA	920,000	Paved
Nickel	28,000,000	130,000	130,000	Paved
Selenium	10,000,000	5,000	5,000	Paved
Vanadium	7,400,000	980,000	980,000	Paved

1 FDEP SCTL (FDEP, 1999).
2 NAS Cecil Field site-specific IBDS value (HLA, 1998).

2.8 DESCRIPTION OF REMEDIAL ALTERNATIVES

This section provides a narrative of each alternative evaluated for the remediation of soil at OU 12, Site 32. For further information on the remedial alternatives, refer to the EE/CA (TtNUS, 2002b) and the Proposed Plan (TtNUS, 2003). Summaries of the treatment alternatives evaluated in the EE/CA are described in the following sections. The remedy selected for this ROD is presented in Section 2.10. As part of the EE/CA (TtNUS, 2002b), each of the following alternatives was evaluated for compliance with related ARARs; Section 3.2 of the EE/CA presents a complete list of these ARARs. It should be noted that the ARARs presented in Section 2.11 and Tables 2-7 through 2-12 of this ROD are specific to the selected remedy.

Three remedial alternatives were analyzed for OU 12, Site 32 soil. This ROD has selected Alternative 2: LUCs and Monitoring to address contaminants remaining in soil following excavation activities.

2.8.1 Alternative 1: No Action

Evaluation of the No Action alternative is required by law to provide a baseline for comparison with other alternatives. Under this alternative, no remedial activities would occur to remove soil contamination, and no controls would be implemented to prevent exposure by human receptors. Although PAHs and 4-methylphenol would attenuate naturally, the inorganic COCs probably would not, and no periodic monitoring would be performed to evaluate contamination reduction or to verify that no contaminant migration is occurring.

This alternative would not protect human health because risks from exposure to contaminated soil would exist. This alternative would not achieve the RAOs or comply with ARARs. There would be no reduction of contaminant mobility, and reduction in toxicity and volume would occur only through long-term natural attenuation and would not be monitored. Because no remedial action would take place, this alternative would not result in any immediate risks to on-site receptors or the surrounding community and would be very easy to implement. There would be no cost associated with this alternative.

2.8.2 Alternative 2: LUCs and Groundwater Monitoring

The LUCs under this alternative would consist of: (1) restricting current land use to industrial and/or commercial purposes so as to prevent future residential development; (2) ensuring that the current asphalt pavement is maintained; and (3) prohibiting excavation of the asphalt cover or any unpaved areas within the site with soil contamination in excess of health-based levels, without prior written consent by the Navy, EPA, and FDEP. Prohibited residential uses include but shall not be limited to residential and residential-like uses such as housing, child preschool, day care, or nurseries, and adult convalescent or nursing home facilities. Monitoring would consist of long-term groundwater sampling and analysis to verify that no contaminants are migrating from soil to groundwater. This monitoring is required because soil contaminant concentrations remaining at the site exceed FDEP leachability to groundwater criteria. Regular site inspections would be conducted to verify the continued application of LUCs. A site review would be performed at the end of 5 years to confirm the continued protectiveness of the remedy.

This alternative would protect human health because it would reduce the risk from direct exposure to contaminated soil by properly maintaining the asphalt pavement, prohibiting excavation of any contaminated areas within the site and by prohibiting residential development. This alternative would achieve the soil RAO but would not comply with chemical-specific ARARs or TBCs because the 95-percent UCL for BaPEqs and the concentrations of several inorganic COCs exceed residential SCTLs. However, for the intended future land use (industrial), this alternative would be protective as long as the chosen LUCs are maintained. There would be no reduction of contaminant toxicity, mobility, or volume through active treatment, but contaminant toxicity and volume would be reduced through long-term natural attenuation. There would be minimal short-term risks associated with the performance of monitoring activities that could easily be addressed through appropriate on-site worker health and safety procedures. The activities for this alternative would be easy to implement. The capital, 30-year operating and maintenance (O&M), and net present worth (NPW) costs of this alternative are estimated at $11,000, $101,000, and $49,000, respectively.

2.8.3 Alternative 3: Excavation and Off-Base Disposal

This alternative would consist of excavating approximately 1,165 cubic yards of asphalt and 2,630 cubic yards of contaminated soil to reduce the site-wide 95-percent UCLs of remaining concentrations of BaPEq in the unpaved areas and concentrations of 4-methylphenol, arsenic, barium, cadmium, lead, nickel, manganese, selenium, and vanadium to less than FDEP residential SCTLs and concentrations of antimony to less than the IBDS value in the paved areas. Excavated areas would be backfilled with clean soil, and the site would be restored to pre-excavation conditions. The excavated soil would be transported off base to a permitted facility for disposal. Prior to landfilling, the excavated asphalt might

require screening, crushing, and grinding to reduce particle size to less than 3 inches. Also, the excavated soil might be treated, if required, by such technologies as chemical fixation/solidification and/or low-temperature thermal desorption (LTTD). However, based on experiences from recent soil removal actions at similar NAS Cecil Field sites, it is not anticipated that such soil treatment would be required.

This alternative would protect human health because it would permanently remove contaminated soil from the site and thus prevent unacceptable risk from exposure under any current or future land use scenario. This alternative would achieve the soil RAO and comply with ARARs through removal, treatment, and disposal. There would be a significant reduction of contaminant toxicity, mobility, or volume through treatment, and an estimated 2,630 cubic yards of soil containing approximately 10,000 pounds of COCs would be irreversibly and permanently removed from the site. There could be significant short-term risks associated with excavation of the contaminated soil and the off-base transportation of the excavated soil. However, these risks could be addressed through appropriate engineering controls and on-site worker health and safety procedures. This alternative would achieve the soil cleanup goals within an estimated 2 to 3 months. The activities for this alternative would be easy to implement. The capital and NPW costs of this alternative are estimated at $676,000. There are no O&M costs associated with this alternative.

2.9 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section evaluates and compares each of the remedial alternatives with respect to the nine criteria outlined in Section 300.430(e) of the NCP. These criteria are categorized as threshold, primary balancing, and modifying and are further explained in Table 2-5. A detailed analysis was performed for each alternative using the nine criteria to select a site remedy, and Table 2-6 presents a summary comparison of these analyses.

2.10 SELECTED REMEDY

2.10.1 Summary of Rationale for Remedy Selection

The goals of the selected remedy are to protect human health and the environment by eliminating, reducing, or controlling hazards posed by the site and to meet ARARs. Based on consideration of the requirements of CERCLA, the NCP, the detailed analysis of alternatives, and any comments received from U.S. EPA, FDEP, and the public, Alternative 2, LUCs and Monitoring, was selected to address contamination at OU 12, Site 32.

This remedy was selected for the following reasons:

- Although concentrations of COCs remaining in soil exceed FDEP residential SCTLs or IBDS values, they do not present an unacceptable threat to human health or the environment assuming that only industrial and/or commercial uses are permitted at Site 32 and that the asphalt pavement is maintained. This plan will achieve risk reduction by imposing restrictions (LUCs) on site land usage and by requiring the owner of the site to properly maintain the asphalt cover.

- To date, there is no evidence of ongoing contaminant migration from the soil to the surficial aquifer beneath Site 32. Studies have shown that the concentrations of COCs in the groundwater beneath Site 32 are less than FDEP GCTLs, U.S. EPA MCLs, and/or IBDS values.

2.10.2 Remedy Description

The remedy is illustrated on Figure 2-5 and consists of three major components: (1) LUCs, (2) long-term monitoring of groundwater, and (3) a contingency remedy.

Component 1: Land Use Controls

Soil contamination remains at Site 32 at concentrations that preclude unrestricted reuse; therefore, the remedy includes LUCs to prevent unacceptable risk. These LUCs will be implemented to prohibit residential development at Site 32 and thereby preclude unacceptable risks from exposure to contaminated soil. The LUCs, by way of periodic inspections, will also ensure that the owner of the site is properly maintaining the asphalt cover. The boundaries of OU 12, Site 32 and the area to be covered by the soil LUCs are shown in Figure 2-3. The following are the LUC performance objectives for OU 12, Site 32, and these objectives will also be incorporated into the deed and/or other LUCs mechanisms:

- Prohibit residential reuse of the site.
- Prohibit the excavation and uncontrolled removal of soil with contaminant concentrations greater than FDEP residential SCTLs unless prior written approval is obtained from the Navy, U.S. EPA, and FDEP.
- Maintain the integrity of the 63,000 square feet of asphalt cover that surrounds Building 325.
- Maintain the integrity of any existing or future monitoring or remediation system(s).

The LUCs shall be implemented for as long as they are required to prevent unacceptable exposure to contaminated soil or to preserve the integrity of the remedy. The Navy or any subsequent owners shall not modify, delete, or terminate any LUC without U.S. EPA and FDEP concurrence. The LUCs shall be maintained until the concentrations of hazardous substances in the soils beneath Site 32 have been reduced to levels that allow for unlimited exposure.

The Navy is responsible for implementing, inspecting, reporting, and enforcing the LUCs described in this ROD in accordance with the approved LUC Remedial Design. Although the Navy retains ultimate responsibility for the performance of these obligations and remedy integrity, the Navy may arrange, by contract or otherwise, for another party(ies) to carry them out. Should any LUC remedy fail, the Navy will ensure that appropriate actions are taken to reestablish the remedy's protectiveness and may initiate legal action to either compel action by a third party(ies) and/or to recover the Navy's costs for remedying any discovered LUC violation(s).

The LUC Remedial Design will be prepared as the LUC component of the selected remedy. Within 90 days of ROD signature, the Navy shall prepare and submit to U.S. EPA and FDEP for review and approval, a LUC Remedial Design that shall contain implementation and maintenance actions, including periodic inspections. The Navy will implement, maintain, monitor, and enforce the LUCs according to the Remedial Design.

Component 2: Long-Term Monitoring

Long-term monitoring will consist of the periodic collection and analysis of groundwater samples to verify that no contaminant migration is occurring from soil to groundwater.

Monitoring will be conducted for as long as contamination at Site 32 remains at concentrations greater than residential and leachability SCTLs, and sampling will be on a 5-year basis. Groundwater samples will be collected from one existing and one proposed monitoring well and analyzed for VOCs, SVOCs, and inorganics. Site conditions will be evaluated every 5 years because this remedial alternative will allow COCs to remain in soils at concentrations that exceed cleanup goals.

Component 3: Contingency Remedy

If the results of any Five-Year Review show that (1) the implemented LUCs have failed to prevent unacceptable risks from exposure to on-site soil contamination; (2) soil contaminants have migrated at unacceptable concentrations past the site boundary; or (3) groundwater analytical results indicate that contaminants have migrated from soil to groundwater at unacceptable concentrations, then additional active remedial measures would need to be evaluated and possibly implemented. Potential contingency remedial measures could include excavation and off-base disposal of contaminated soil and possible groundwater treatment.

2.10.3 Summary of Estimated Remedy Costs

The estimated capital, O&M, and NPW costs of the selected remedy are as follows:

- Capital Cost: $ 11,000
- 30-year O&M Costs: $101,000
- 30-Year NPW of Capital, LUC, and O&M Costs: $ 49,000

The above cost figures have been rounded to the nearest $1,000 to reflect the preliminary nature of the estimates. A detailed breakdown of the above estimates is provided in Appendix B.

2.10.4 Expected Outcomes of the Selected Remedy

The expected outcomes of the selected remedy may be summarized as follows:

- Immediately upon implementation of the remedy, Site 32 will be environmentally safe for its intended reuse as an industrial and/or commercial facility as long as the LUCs are in place and observed.

- Site 32 is currently used for military reserve functions within the industrial portion of the former NAS Cecil Field. The JEDC Reuse Plan prescribes commercial/military-related reuse for this area, although a specific activity has not yet been identified. It is anticipated that the reuse of the former NAS Cecil Field, including Site 32, will be beneficial to the Jacksonville area and expand the tax base of Duval County.

2.11 STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the selected remedy must be protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), be cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants, or contaminants. The following sections discuss how the selected remedy meets these statutory requirements.

2.11.1 Protection of Human Health and the Environment

The selected remedy, Alternative 2, will protect human health and the environment. LUCs will prevent the future residential development of the site. The reduced frequency of exposure and potential pathways associated with an industrial scenario result in a reduced potential intake of constituents of concern and consequently, reduced risks to human health. Post-excavation soil concentrations of BaP and BaPEqs in the unpaved area of the site were less than the industrial SCTL for BaP. Therefore, risks from exposure

to these soils are acceptable under a non-residential land use scenario. Concentrations of inorganics exceeding FDEP residential and industrial SCTLs in soil beneath the paved area of the site result in hazard indices greater than 1.0. However, LUCs enforcing maintenance and prohibiting excavation of the asphalt pavement over this area of the site preclude exposure that could cause unacceptable risks. In addition, maintenance of the asphalt cap integrity will prevent or at least minimize the potential for migration of any COCs in the soil beneath the paved areas to the surficial aquifer beneath the site.

2.11.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy, Alternative 2, will comply with all ARARs. The ARARs that the selected remedy complies with are presented below and in more detail in Table 2-7 through Table 2-12. There are no Location-Specific ARARs.

The Chemical- and Action-Specific ARARs include the following:

- Safe Drinking Water Act (SWDA) MCLs (40 CFR Part 141), This is a Chemical-Specific ARAR that specifies acceptable concentration levels in groundwater that serves as a potential drinking water aquifer.

- Groundwater Classes, Standards, and Exemptions [Florida Administrative Code (FAC) Chapter 62-520]. This is a Chemical-Specific ARAR that designates the groundwater of the State into five classes and establishes minimum “free from” criteria (i.e., what contaminants are prohibited from being present in a particular class of aquifer).

- Occupational Safety and Health Act (OSHA), General Industry Standards (29 CFR Part 1910, Subpart Z). This is an Action-Specific ARAR that requires the establishment of programs to assure worker health and safety at hazardous waste sites.

- OSHA Occupational Safety and Health Regulations (29 CFR Part 1910). This is an Action-Specific ARAR that establishes permissible exposure limits for workplace exposure to specific chemicals.

- OSHA Recordkeeping, Reporting, and Related Regulations (29 CFR Part 1904). This is an Action-Specific ARAR that dictates recordkeeping and reporting requirement for remedial activities.

- OSHA Health and Safety Standards (29 CFR Part 1926). This is an Action-Specific ARAR that specifies the type of safety training, equipment, and procedures to be used during remediation.

- Florida Water Well Permitting and Construction Requirement - March 1992 (FAC 62-532). This is an Action-Specific ARAR that establishes minimum standard for location, construction, repair, and abandonment of water wells.

- Florida Rules on Hazardous Waste Warning Signs - July 1991 (FAC 62-736). This is an Action-Specific ARAR that requires appropriate warning signs for public protection at NPL and FDEP hazardous waste sites.

- Drinking Water Criteria (FAC Chapter 62-550). This Chemical-Specific ARAR provides primary and secondary drinking water quality criteria.

2.11.3 Other Criteria, Advisories, or Guidance To Be Considered for This Remedial Action

In implementing the selected remedy, the Navy, U.S. EPA and the State have agreed to consider a number of non-binding criteria that are TBCs. These include:

- Safe Drinking Water Act (SDWA) Regulations, National Secondary Drinking Water Standards SMCLs, (40 CFR 143). This Chemical-Specific TBC establishes welfare-based standards for public water systems.

- Cancer Slope Factors (Integrated Risk Information System). This Chemical-Specific TBC provides guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants.

- Reference Dose Factors (Integrated Risk Information System). This Chemical-Specific TBC provides guidance values used to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.

- Contaminant Cleanup Target Levels Rule (FAC Chapter 62-777). This Chemical-Specific TBC provides values for soil, groundwater, and surface water cleanup.

- U.S. EPA Monitored Natural Attenuation Guidance. This provides guidance on evaluation of monitored natural attenuation.

2.11.4 Cost-Effectiveness

The selected remedy is deemed to be cost-effective and to represent a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost-

effective if it costs are proportional to its overall effectiveness." [NCP §300.430(f)(1)(ii)(D)]. This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., both were protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money spent.

The estimated 30-year NPW cost of the selected remedy is $49,000.

2.11.5 Utilization of Permanent Solutions and Alternative Treatment Technologies

The Navy and U.S. EPA, in conjunction with FDEP, have determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at Site 32. Of those alternatives that are protective of human health and the environment and comply with ARARs, the Navy and U.S. EPA, in consultation with FDEP, have determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria while also considering the statutory preference for treatment as a principal element and bias against off-site treatment and disposal and considering State and Community acceptance.

2.11.6 Preference for Treatment as a Principal Element

Although the selected remedy does not meet the statutory preference for treatment as a principal element, reduction of soil contaminant concentrations are expected over time due to such naturally occurring processes as biological degradation.

2.11.7 Five-Year Review Requirement

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted every 5 years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

2.12 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU 12, Site 32 (TtNUS, 2003) was released for public comment on September 24, 2003. The Proposed Plan identified Alternative 2, LUCs and Monitoring, as the preferred alternative. The public was invited to comment during a 30-day period extending from September 24 to October 24, 2003.

No changes to the proposed remedy, as originally identified in the Proposed Plan, have been made as a result of public comments.

TABLE 2-1

**SUMMARY OF PRE-IRA ANALYTICAL DATA
FOR SOIL IN UNPAVED AREAS
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 2**

Analyte	Unit	Minimum Detection	Maximum Detection	Frequency of Detection	FDEP Direct Exposure Residential SCTL[1]	FDEP Direct Exposure Industrial SCTL[1]	FDEP Leachability to Groundwater SCTL[1]	IBDS[2]
1-Methylnaphthalene	µg/kg	72.2	**3,360**	7/37	68,000	470,000	**2,200**	NC
2-Methylnaphthalene	µg/kg	76.4	580	12/37	80,000	560,000	6,100	NC
Acenaphthene	µg/kg	80.1	**12,200**	15/37	1,900,000	18,000,000	**2,100**	NC
Acenaphthylene	µg/kg	98.9	504	5/37	1,100,000	11,000,000	27,000	NC
Anthracene	µg/kg	82.5	2,090	4/37	18,000,000	260,000,000	2,500,000	NC
Benzo(a)anthracene	µg/kg	14	**4,200**	25/37	**1,400**	5,000	**3,200**	NC
Benzo(a)pyrene	µg/kg	17.6	**4,640**	27/37	**100**	**500**	8,000	NC
Benzo(b)fluoranthene	µg/kg	14.2	**3,790**	26/37	**1,400**	4,800	10,000	NC
Benzo(ghi)perylene	µg/kg	20.5	2,350	28/37	2,300,000	41,000,000	32,000,000	NC
Benzo(k)fluoranthene	µg/kg	11.6	1,540	25/37	15,000	52,000	25,000	NC
Chrysene	µg/kg	13.1	3,270	27/37	140,000	450,000	77,000	NC
Dibenzo(ah)anthracene	µg/kg	15.7	**226**	11/37	**100**	500	30,000	NC
Fluoranthene	µg/kg	32.3	12,200	26/37	2,900,000	48,000,000	1,200,000	NC
Fluorene	µg/kg	77.6	908	6/37	2,200,000	28,000,000	160,000	NC
Indeno(123-cd)pyrene	µg/kg	20	**3,000**	25/37	**1,500**	5,300	28,000	NC
Naphthalene	µg/kg	72.5	623	8/37	40,000	270,000	1,700	NC
Phenanthrene	µg/kg	103	6,570	14/37	2,000,000	30,000,000	250,000	NC
Pyrene	µg/kg	18.3	8,010	24/37	2,200,000	37,000,000	880,000	NC

TABLE 2-1

**SUMMARY OF PRE-IRA ANALYTICAL DATA
FOR SOIL IN UNPAVED AREAS
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 2 OF 2**

Analyte	Unit	Minimum Detection	Maximum Detection	Frequency of Detection	FDEP Direct Exposure Residential SCTL[1]	FDEP Direct Exposure Industrial SCTL[1]	FDEP Leachability to Groundwater SCTL[1]	IBDS[2]
Aluminum	mg/kg	142	2,400	4/4	72,000	NC	NC	4,430
Barium	mg/kg	3.5	7.4	4/4	110	87,000	1,600	14.4
Cobalt	mg/kg	0.12	0.23	3/4	110	87,000	1,600	14.4
Copper	mg/kg	0.72	4.6	4/4	110	76,000	NC	5.97
Iron	mg/kg	115	766	4/4	23,000	480,000	NC	1,490
Lead	mg/kg	2.4	21.6	4/4	400	920	NC	197
Manganese	mg/kg	3.2	19.2	4/4	1,600	22,000	NC	22
Mercury	mg/kg	0.01	0.01	1/4	3.4	26	2.1	0.16
Nickel	mg/kg	1.3	1.3	1/4	110	28,000	130	3.89
Vanadium	mg/kg	1.7	2.9	3/4	15	7,400	980	6.3
Zinc	mg/kg	4.8	34.1	4/4	23,000	560,000	6,000	37

1 Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).
2 NAS Cecil Field site-specific Inorganic Background Data Set (HLA, 1998).

NC = No criterion.
Bold indicates exceedance of Industrial or Leachability to Groundwater SCTL.

TABLE 2-2

SUMMARY OF ANALYTICAL DATA FOR SOIL BENEATH THE ASPHALT PAVEMENT OPERABLE UNIT 12, SITE 32 RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA PAGE 1 OF 2

Analyte	Unit	Minimum Detection	Maximum Detection	Frequency of Detection	FDEP Direct Exposure Residential SCTL(1)	FDEP Direct Exposure Industrial SCTL(1)	FDEP Leachability to Groundwater SCTL(1)	IBDS(2)
Tetrachloroethene	µg/kg	2	2	1/5	6,000	8,500	30	NC
4-Methylphenol	µg/kg	**45**	**45**	1/5	250,000	3,000,000	**30**	NC
BEHP	µg/kg	100	100	1/5	76,000	280,000	3,600,000	NC
4, 4-DDE	µg/kg	0.5	0.5	1/5	3,300	13,000	18,000	NC
4, 4-DDT	µg/kg	0.26	0.95	3/5	3,300	13,000	11,000	NC
alpha-Chlordane	µg/kg	0.1	0.1	1/5	3,100	12,000	9,600	NC
Endosulfan II	µg/kg	0.18	0.18	1/5	410,000	6,700,000	3,800	NC
Heptachlor epoxide	µg/kg	0.08	0.08	1/5	100	400	600	NC
Acenaphthene	µg/kg	111	1,400	2/9	1,900,000	18,000,000	2,100	NC
Benzo(a)anthracene	µg/kg	80.1	300	2/9	1,400	5,000	3,200	NC
Benzo(a)pyrene	µg/kg	77.3	**280**	2/9	**100**	500	8,000	NC
Benzo(b)fluoranthene	µg/kg	103	490	2/9	1,400	4,800	10,000	NC
Benzo(ghi)perylene	µg/kg	55.2	340	2/9	2,300,000	41,000,000	32,000,000	NC
Benzo(k)fluoranthene	µg/kg	58.8	160	2/9	15,000	52,000	25,000	NC
Chrysene	µg/kg	99.5	420	3/9	140,000	450,000	77,000	NC
Fluoranthene	µg/kg	206	15,000	2/9	2,900,000	48,000,000	1,200,000	NC
Indeno(123-cd)pyrene	µg/kg	65.6	220	2/9	1,500	5,300	28,000	NC
2-methylnaphthalene	µg/kg	79.6	1,400	2/9	80,000	560,000	6,100	NC
Phenanthrene	µg/kg	125	780	2/9	2,000,000	30,000,000	250,000	NC
Pyrene	µg/kg	162	980	2/9	2,200,000	37,000,000	880,000	NC

TABLE 2-2

SUMMARY OF ANALYTICAL DATA FOR SOIL BENEATH THE ASPHALT PAVEMENT OPERABLE UNIT 12, SITE 32 RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

Analyte	Unit	Minimum Detection	Maximum Detection	Frequency of Detection	FDEP Direct Exposure Residential SCTL(1)	FDEP Direct Exposure Industrial SCTL(1)	FDEP Leachability to Groundwater SCTL(1)	IBDS(2)
Aluminum	mg/kg	962	5,560	14/14	72,000	NC	NC	4,430
Antimony	mg/kg	5.8	**206**	2/14	**26**	240	**5**	**9.44**
Arsenic	mg/kg	3.8	**3.8**	1/14	**0.8**	**3.7**	29	2.04
Barium	mg/kg	2.2	**2,990**	14/14	**110**	87,000	**1,600**	14.4
Cadmium	mg/kg	1.3	**30.2**	3/14	**75**	1,300	**8**	1.72
Cobalt	mg/kg	0.12	70.5	8/14	4,700	110,000	NC	3.11
Copper	mg/kg	0.29	48.5	9/14	110	76,000	NC	5.97
Iron	mg/kg	161	6,970	14/14	23,000	480,000	NC	1,490
Lead	mg/kg	1.1	**1,850**	14/14	**400**	**920**	NC	197
Manganese	mg/kg	1.1	**2,560**	13/14	**1,600**	22,000	NC	22
Mercury	mg/kg	0.01	0.02	4/14	3.4	26	2.1	0.16
Nickel	mg/kg	2.0	**202**	9/14	**110**	28,000	**130**	3.89
Selenium	mg/kg	77.4	**1,030**	4/14	**390**	10,000	**5**	1.68
Vanadium	mg/kg	0.78	**2,100**	14/14	**15**	7,400	**980**	6.3
Zinc	mg/kg	2.8	1,710	14/14	23,000	560,000	6,000	37

1 Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).
2 NAS Cecil Field site-specific Inorganic Background Data Set (HLA, 1998).

BEHP = bis(2-Ethylhexyl) phthalate.
NC = No criterion.
Bold indicates exceedance of Industrial or Leachability to Groundwater SCTL.

TABLE 2-3

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
PHASE II INVESTIGATION SAMPLING
SITE 32 RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	CEF-1032-01 (µg/L)	FDEP GCTL(3)	U.S. EPA MCL(3)	IBDS Value(3)
alpha-HCH	0.0039	0.006	NC	NC
Aluminum	1,200	200(1)	200(1)	13,100
Barium	78.5	97(2)	2,000	88.2
Calcium	62,200	NC	NC	81,100
Chromium, Total	6.5	100	100	18
Cobalt	0.64	420	NC	12.8
Copper	0.77	1,300(1)	1,300(1)	12.5
Iron	1,700	300(1)	300(1)	7,760
Lead	2.6	15	15	5.35
Magnesium	3,030	NC	NC	10,000
Manganese	78.4	50(1)	50(1)	150
Potassium	1,080	NC	NC	4,330
Sodium	7,810	160,000	NC	16,500

FDEP Florida Department of Environmental Protection Groundwater Cleanup Target Level (FDEP,1999).
IBDS NAS Cecil Field site-specific Inorganic Background Data Set (HLA, 1998).
NC No criterion.
U.S. EPA United States Environmental Protection Agency Maximum Contaminant Levels (MCLs) (U.S. EPA, 2000)

1 Secondary drinking water regulation.
2 Site concentration cannot be greater than 10 percent above background.
3 Values reported in µg/L.

TABLE 2-4

SUMMARY OF POST-IRA SOIL ANALYTICAL DATA
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Unit	Minimum Detection	Maximum Detection	Mean	UCL	FDEP Direct Exposure Residential SCTL[1]	FDEP Direct Exposure Industrial SCTL[1]	FDEP Leachability to Groundwater SCTL[1]
BaP	µg/kg	17.6	1,350	200	279	100	500	8,000
BaPEq	µg/kg	12.0	1,631	283	379	100	500	8,000

1 Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).

BaPEq = Benzo(a)pyrene equivalents.
Mean = Arithmetic mean of analytical data.
UCL = 95-percent upper confidence limit of the mean.

TABLE 2-5

EXPLANATION OF DETAILED ANALYSIS CRITERIA
OPERABLE UNIT 12, SITE 32 RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Criterion	Description
Threshold	**Overall Protection of Human Health and the Environment.** This criterion evaluates the degree to which each alternative eliminates, reduces, or controls threats to human health and the environment through treatment, engineering methods, or institutional controls (e.g., access restrictions). **Compliance with State and Federal Regulations.** The alternatives are evaluated for compliance with environmental protection regulations determined to be applicable or relevant and appropriate to the site conditions.
Primary Balancing	**Long-Term Effectiveness and Permanence.** The alternatives are evaluated based on their ability to maintain reliable protection of human health and the environment after implementation. **Reduction of Contaminant Toxicity, Mobility, and Volume Through Treatment**. Each alternative is evaluated based on how it reduces the harmful nature of the contaminants, their ability to move through the environment, and the amount of contamination. **Short-Term Effectiveness.** The risks that implementation of a particular remedy may pose to workers and nearby residents (e.g., whether or not contaminated dust will be produced during excavation), as well as the reduction in risks that results by controlling the contaminants, are assessed. The length of time needed to implement each alternative is also considered. **Implementability**. Both the technical feasibility and administrative ease (e.g., the amount of coordination with other government agencies needed) of a remedy, including availability of necessary goods and services, are assessed. **Cost.** The benefits of implementing a particular alternative are weighed against the cost of implementation.
Modifying	**U.S. EPA and FDEP Acceptance.** The final Feasibility Study and the Proposed Plan, which are placed in the Administrative Record, represent a consensus by the Navy, U.S. EPA, and FDEP. **Community Acceptance.** The Navy assesses community acceptance of the preferred alternative by giving the public an opportunity to comment on the remedy selection process and the preferred alternative and then responds to those comments.

TABLE 2-6

SUMMARY OF COMPARATIVE ANALYSIS OF SOIL REMEDIAL ACTION ALTERNATIVES
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Evaluation Criteria	Alternative 1: No Action	Alternative 2: LUCs and Monitoring	Alternative 3: Excavation and Off-Base Disposal
Overall Protection of Human Health and Environment	Would not be protective because residential development could occur that would result in unacceptable risks to human and ecological receptors. The threat of soil COCs migrating to the groundwater would remain.	Would be protective of the environment by preventing residential development and detecting the migration of soil COCs.	Would be most protective by eliminating the risk of exposure to soil contaminated above SCTLs for direct residential exposure or background concentrations and minimizing the potential for migration of COCs to groundwater.
Compliance with ARARs and TBCs: Chemical-Specific Location-Specific Action-Specific	 Would not comply Would not comply Not applicable	 Would not comply Would comply Would comply	 Would comply Would comply Would comply
Long-Term Effectiveness and Permanence	Would have very limited long-term effectiveness and permanence because all contaminants would remain on site. Any long-term effectiveness would not be known because monitoring would not occur.	Would be long-term effective and permanent. The prevention of residential development through deed restrictions and the monitoring of contaminants to evaluate their migration would provide long-term effectiveness and permanence.	Would provide the most long-term effectiveness and permanence. Risks from exposure to contaminated soil under any land use scenario and from the potential contaminant migration would be effectively and permanently eliminated through excavation, treatment, and disposal.
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment but may achieve some reduction through natural processes.	Would not achieve reduction of toxicity, mobility, or volume of contaminants through treatment but may achieve some reduction through natural processes.	2,630 cubic yards of contaminated soil and 1,165 cubic yards of asphalt would be permanently removed from the site. Disposal would reduce contaminant mobility and toxicity.

TABLE 2-6

SUMMARY OF COMPARATIVE ANALYSIS OF SOIL REMEDIAL ACTION ALTERNATIVES
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Evaluation Criteria	Alternative 1: No Action	Alternative 2: LUCs and Monitoring	Alternative 3: Excavation and Off-Base Disposal
Short-Term Effectiveness	Would not result in short-term risks to site workers or adversely impact the surrounding community but would also not achieve RAOs and cleanup goals.	Would result in slight risk to site workers during sampling of the soil and groundwater. This risk would be reduced through the wearing of appropriate PPE and the compliance with site-specific health and safety procedures. RAOs would be achieved immediately upon implementation. Eventual compliance with cleanup goals would be determined through monitoring.	Would result in a significant risk of exposure to site workers to contaminated soil during the excavation and off-base disposal activities. This risk would be reduced through wearing of appropriate PPE and compliance with site-specific health and safety procedures. The RAOs would be achieved immediately upon implementation. Cleanup goals would be attained within 2 months.
Implementability	Would be simple to implement because no action would occur.	Would be easy to implement because the resources, materials, and equipment are readily available. Provisions would be incorporated into the property transfer documents to ensure the continuation of the LUCs and monitoring when ownership of the site is transferred to the private sector.	Would be more difficult to implement because contaminated soil would have to be excavated and transported off-base for disposal. No LUCs or monitoring would be required. A construction permit and manifesting would also be required.
Costs: Capital 30-Year O&M NPW	 $0 $0 $0	 $11,000 $101,000 $49,000 (30-Year)	 $676,000 $0 $676,000

TABLE 2-7

FEDERAL CHEMICAL-SPECIFIC ARARs FOR SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Authority	Medium	Requirement	Citation	Status	Synopsis of Requirement	Action To Be Taken To Attain Requirement
Federal Regulatory Requirement	Groundwater	Safe Drinking Water Act (SDWA) Regulations, Maximum Contaminant Levels (MCLs)	40 CFR Part 141	Relevant and Appropriate	Establishes enforceable standards for potable water for specific contaminants that have been determined to adversely affect human health.	Will be used to establish protective levels for groundwater that are current or potential drinking water sources.
Federal Regulatory Requirement	Groundwater	SDWA Regulations, National Secondary Drinking Water Standards (SMCLs)	40 CFR Part 143	To Be Considered (TBC)	Establishes welfare-based standards for public water systems for specific contaminants or water characteristics that may affect the aesthetic qualities of drinking water.	Will be considered to establish protective levels for groundwater that are current or potential drinking water sources.
Federal Advisory	Soil and Water	Cancer Slope Factors (CSFs)		TBC	Guidance values used to evaluate the potential carcinogenic hazard caused by exposure to contaminants.	Were considered for development of human health cleanup goals for soil and groundwater at this site.
Federal Advisory	Soil and Water	Reference Doses (RfDs)		TBC	Guidance values used to evaluate the potential noncarcinogenic hazard caused by exposure to contaminants.	Were considered for development of human health cleanup goals for soil and groundwater at this site.
Federal Guidance	Groundwater	U.S. EPA Monitored Natural Attenuation Guidance		TBC	Provides guidance on the evaluation of monitored natural attenuation.	Was considered in site evaluation.

TABLE 2-8

STATE CHEMICAL-SPECIFIC ARARs OF SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Authority	Medium	Requirement	Citation	Status	Synopsis of Requirement	Action To Be Taken To Attain Requirement
State Regulatory Requirement	Groundwater	Groundwater Classes, Standards and Exemptions	FAC Chapter 62-520	Applicable	This rule designates the groundwater of the state into five classes and establishes minimum “free from” criteria. This rule also specifies that Classes I and II must meet the primary and secondary drinking water standards listed in Chapter 62-550.	This rule was used to establish cleanup goals for groundwater that is a potential source of drinking water.
State Regulatory Requirement	Groundwater	Drinking Water Criteria	FAC Chapter 62-550	Applicable	Provides primary and secondary drinking water quality criteria.	This rule was used to establish cleanup goals for groundwater that is a potential source of drinking water.
State Regulatory Requirement	Soil and Groundwater	Contaminant Cleanup Target Levels Rule	FAC Chapter 62-777	TBC	This rule provides guidance for soil, groundwater, and surface water cleanup levels that can be developed on a site-by-site basis.	This rule was considered for the development of soil and groundwater cleanup goals at this site.

TABLE 2-9

FEDERAL LOCATION-SPECIFIC ARARs FOR SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Authority	Medium	Requirement	Citation	Status	Synopsis of Requirement	Action To Be Taken To Attain Requirement

There are no Federal Location-Specific ARARs

TABLE 2-10

STATE LOCATION-SPECIFIC ARARs FOR SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Authority	Medium	Requirement	Citation	Status	Synopsis of Requirement	Action To Be Taken To Attain Requirement

There are no State Location-Specific ARARs

TABLE 2-11

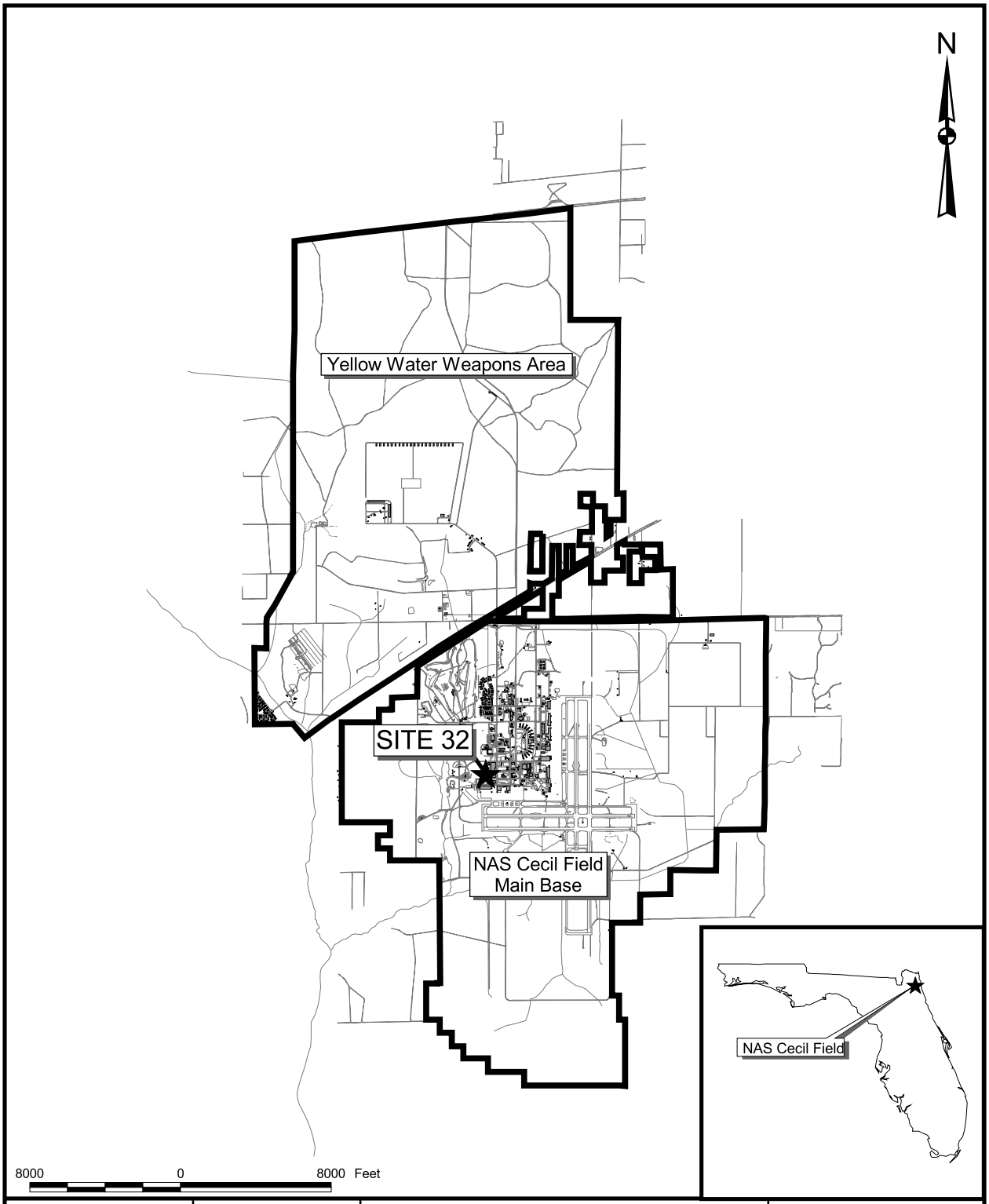
FEDERAL ACTION-SPECIFIC ARARs FOR SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Authority	Medium	Requirement	Citation	Status	Synopsis of Requirement	Action To Be Taken to Attain Requirement
Federal Regulatory Requirement	All	Occupational Safety and Health Act (OSHA), General Industry Standards	29 CFR Part 1910	Applicable	Requires establishment of programs to assure worker health and safety at hazardous waste sites, including employee-training requirements.	These regulations will apply to all soil and groundwater remedial activities.
Federal Regulatory Requirement	All	OSHA, Occupational Health and Safety Regulations	29 CFR Part 1910, Subpart Z	Applicable	Establishes permissible exposure limits for workplace exposure to a specific listing of chemicals.	Will be applied to control worker exposure to OSHA hazardous chemicals during remedial activities.
Federal Regulatory Requirement	All	OSHA, Recordkeeping, Reporting, and Related Regulations	29 CFR Part 1904	Applicable	Provides recordkeeping and reporting requirements applicable to remedial activities.	These requirements will apply to all site contractors and subcontractors and will be followed during all site work.
Federal Regulatory Requirement	All	OSHA, Health and Safety Standards	29 CFR Part 1926	Applicable	Specifies the type of safety training, equipment, and procedures to be used during the site investigation and remediation.	All phases of the remedial response project will be executed in compliance with these standards.

TABLE 2-12

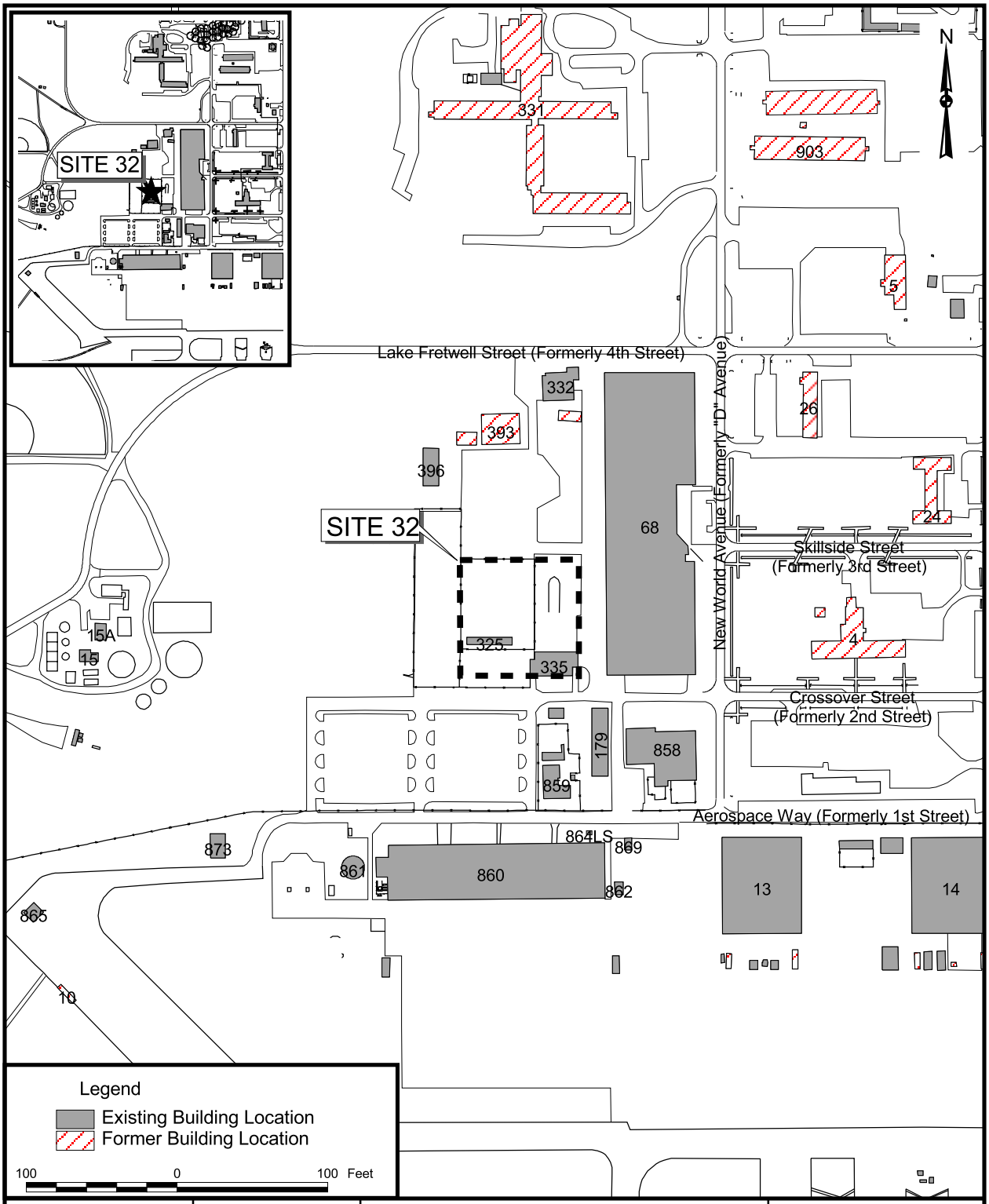
STATE ACTION-SPECIFIC ARARs FOR SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Authority	Medium	Requirement	Citation	Status	Synopsis of Requirement	Action To Be Taken To Attain Requirement
State Regulatory Requirement	Groundwater	Florida Water Well Permitting and Construction Requirements – March 1992	FAC Chapter 62-532	Applicable	Establishes minimum standards for the location, construction, repair, and abandonment of water wells. Permitting requirements and procedures are established.	The substantive requirements for permitting will be met for the construction, repair, or abandonment of monitoring wells.
State Regulatory Requirement	All	Florida Rules on Hazardous Waste Warning Signs – July 1991	FAC Chapter 62-736	Applicable	Requires warning signs at NPL and FDEP - identified hazardous waste sites to inform the public of the presence of potentially harmful conditions.	This requirement will be met.



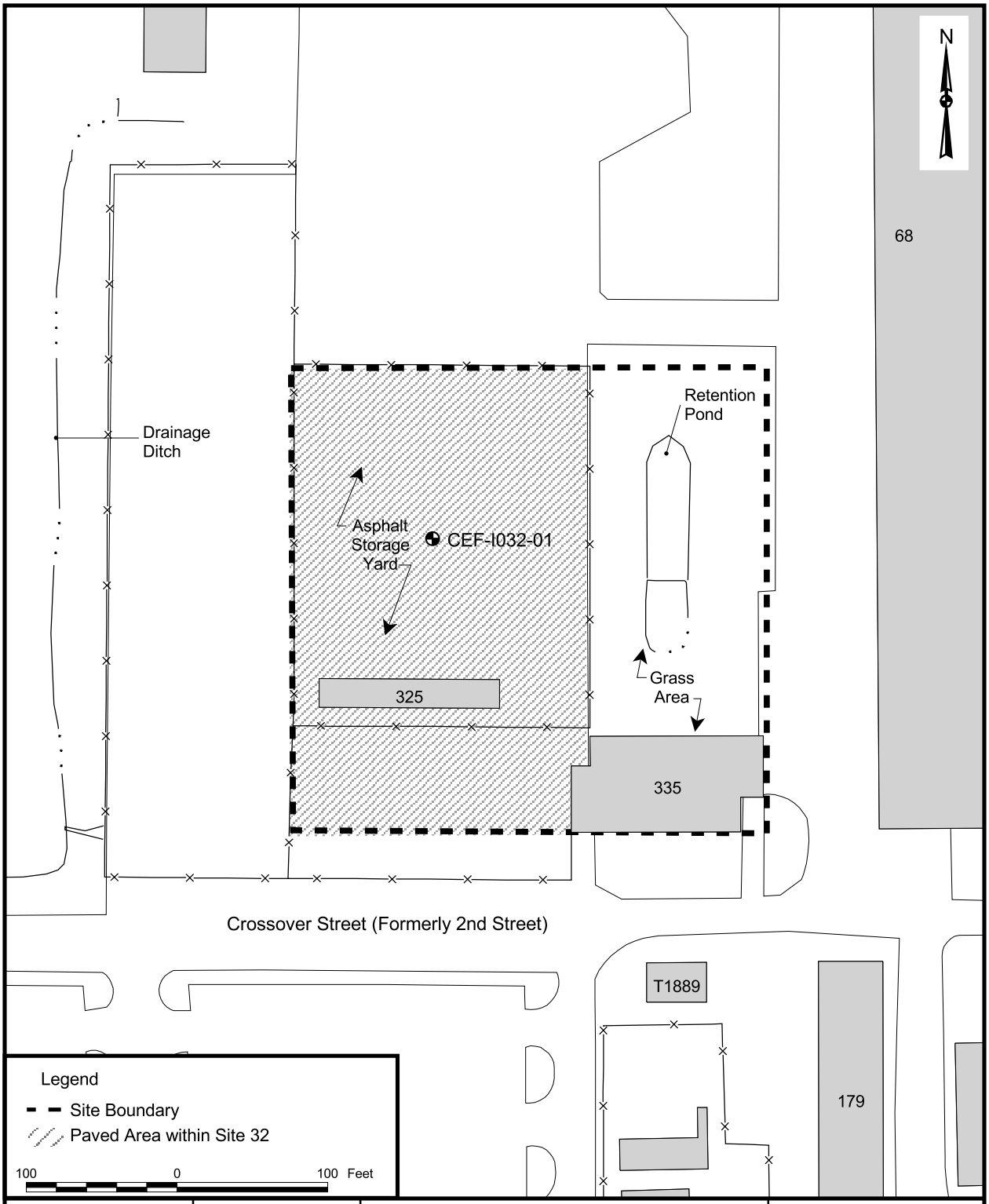
DRAWN BY MJJ	DATE 25Aug03	GENERAL LOCATION MAP OPERABLE UNIT 12 SITE 32 DRMO ASPHALT STORAGE YARD RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-1 / REV 0

P:\GIS\NAS_CecilField\Site-32_ROD.apr 25Aug03 MJJ Site Location Map Layout



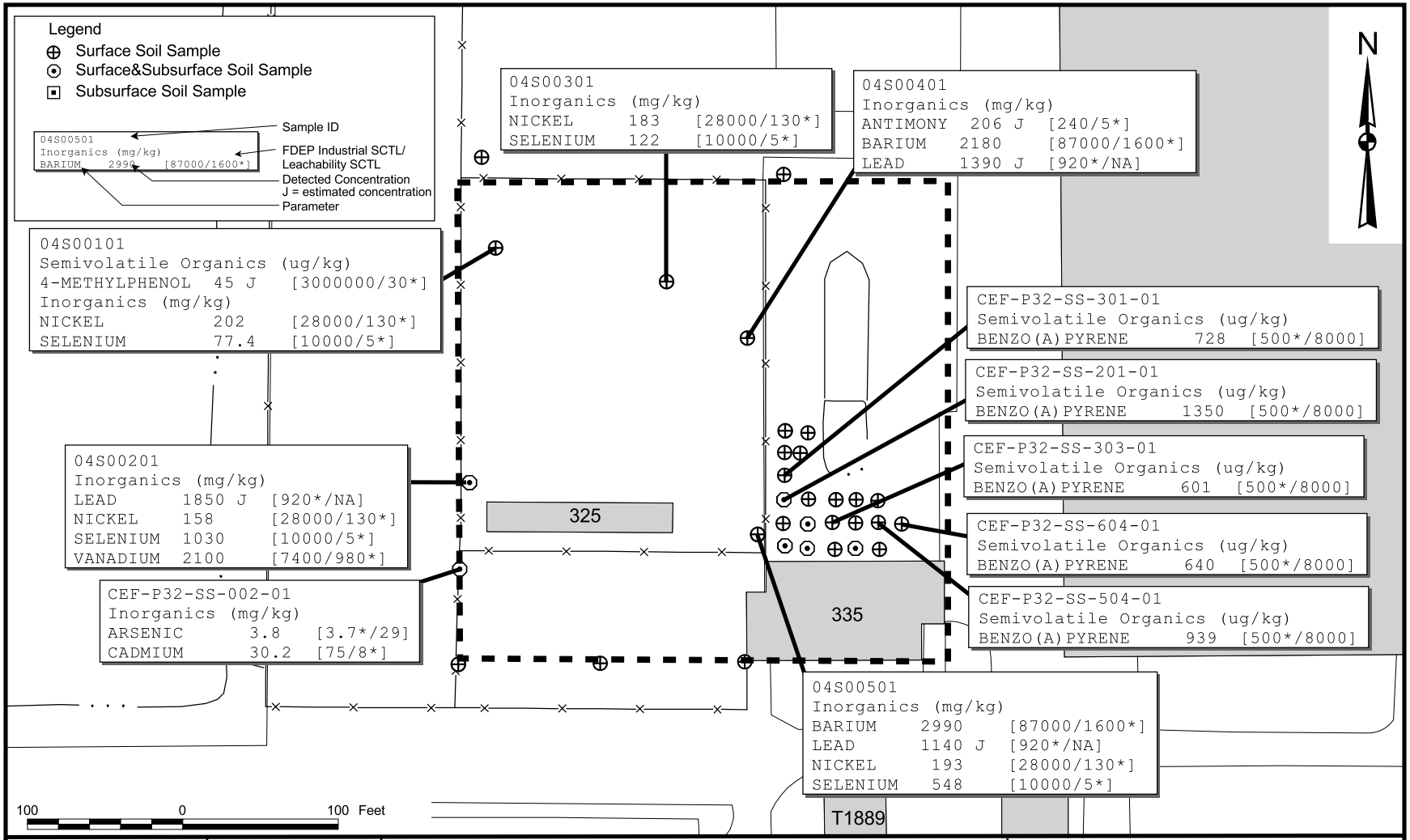
DRAWN BY MJJ	DATE 25Aug03	GENERAL ARRANGEMENT OPERABLE UNIT 12 SITE 32 DRMO ASPHALT STORAGE YARD RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-2 / REV 0

P:\GIS\NAS_CecilField\Site-32_ROD.apr 26Aug03 MJJ Facility Location Layout



DRAWN BY MJJ	DATE 25Aug03	SITE LAYOUT MAP OPERABLE UNIT 12 SITE 32 DRMO ASPHALT STORAGE YARD RECORD OF DECISION NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 4187
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-3 / REV 0

P:\GIS\NAS_CecilField\Site-32_ROD.apr 25Aug03 MJJ Facility Location Layout



DRAWN BY	DATE
MJJ	25Aug03
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

POST-REMOVAL ACTION EXCEEDANCES FOR INDUSTRIAL LAND USE SCENARIO

OPERABLE UNIT 12

SITE 32 DRMO ASPHALT STORAGE YARD

RECORD OF DECISION

NAVAL AIR STATION CECIL FIELD

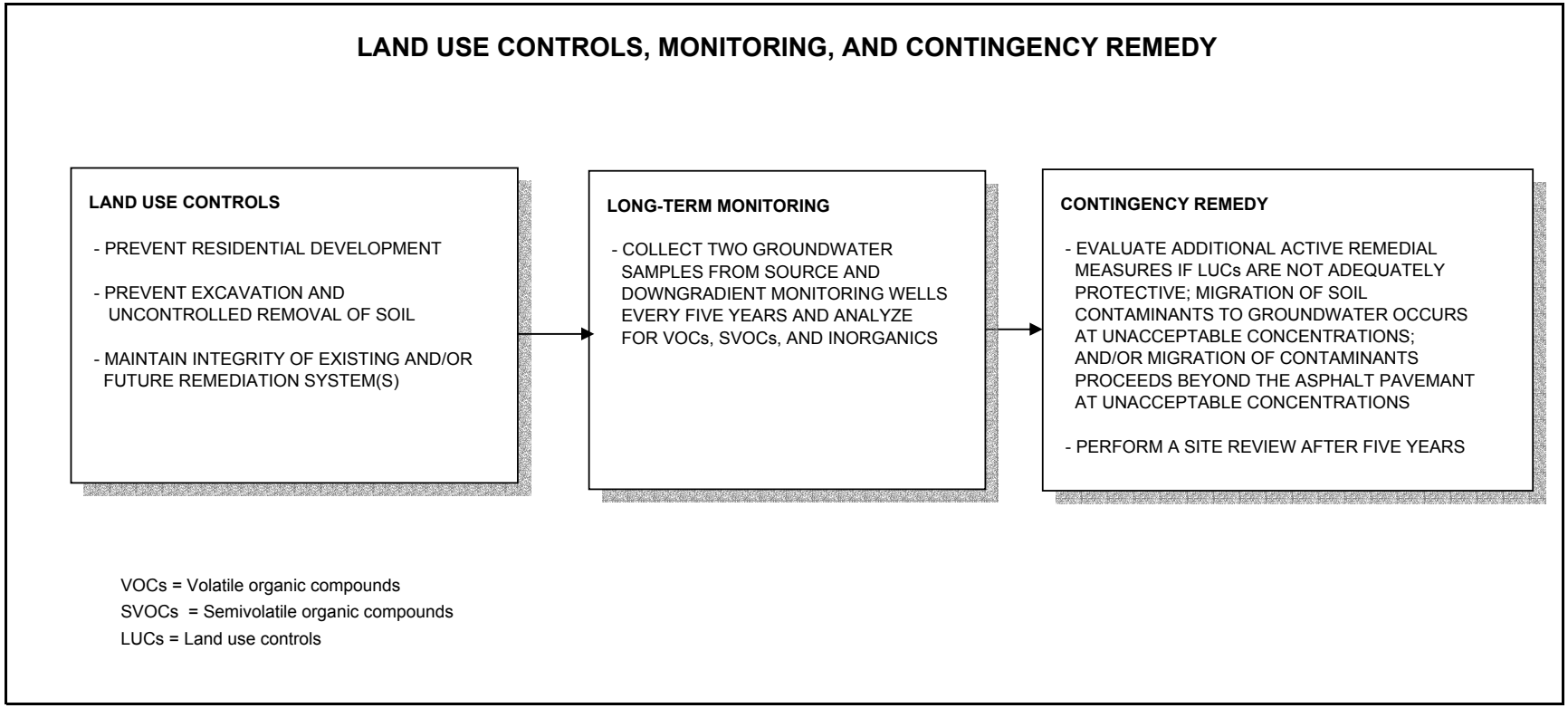
JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
4187	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV
FIGURE 2-4	0

P:\GIS\NAS_CecilField\Site-32_ROD.apr 28Aug03 MJJ Previous Locations Layout

FIGURE 2-5

BLOCK FLOW DIAGRAM
SELECTED REMEDY
OPERABLE UNIT 12, SITE 32
RECORD OF DECISION
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA



REFERENCES

ABB-ES (ABB Environmental Services, Inc.), 1994. Base Realignment and Closure Environmental Baseline Survey. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. November.

ABB-ES, 1995. Sampling and Analysis Outline, Areas of Interest 32 and 33, Base Realignment and Closure, Zone C, Administration and Light Industrial Area, Group II, NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, January.

ABB-ES, 1996. Sampling and Analysis Report, Area of Interest 32, Base Realignment and Closure, Zone C, Administration and Light Industrial Area, Group II, NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, June.

ABB-ES, 1997. Remedial Investigation, Operable Unit 3, Sites 7 and 8, NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. August.

CH2M Hill (CH2M Hill Constructors, Inc.), 2001. Source Removal Report, Excavation of Petroleum-Contaminated Soil at PSC 32, AOI 32, Main Base Hazardous Materials Warehouse/Storage Area, NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, January.

EE (Envirodyne Engineers), 1985. Initial Assessment Study of NAS Cecil Field, Jacksonville, Florida. Prepared for Naval Energy and Environmental Support Activity (NEESA), NEESA 13-073, Port Hueneme, California. July.

FDEP (Florida Department of Environmental Protection), 1999. Contaminant Target Levels Rule, Soil, Groundwater, and Surface Water Target Cleanup Levels. Florida Administrative Code (FAC) Chapter 62-777, August.

G&M (Geraghty & Miller, Inc.), 1983. Year-End Report of Groundwater Monitoring.

G&M, 1985. Year-End Report of Groundwater Monitoring.

HLA (Harding Lawson Associates), 1998. NAS Cecil Field Inorganic Background Data Set. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. July.

TtNUS (Tetra Tech NUS, Inc.), 1998. Base-Wide Generic Work Plan at NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, October.

TtNUS, 1999a. Remedial Investigation for Site 36 - Control Tower TCE Plume and Site 37 - Hangars 13 and 14 DCE Plume. NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, August.

TtNUS, 1999b. Sampling and Analysis Work Plans (Phases I through IV), PSC 32, DRMO Asphalt Storage Yard, NAS Cecil Field. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, May, August, September, and November.

TtNUS, 2000a. Sampling and Analysis Work Plans (Phases V through VII), PSC 32, DRMO Asphalt Storage Yard, NAS Cecil Field. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, January, March, and April.

TtNUS, 2000b. Action Memorandum for PSC 32, AOI 32, Main Base Hazardous Materials Warehouse/Storage Area, NAS Cecil Field. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, May.

TtNUS, 2002a. Technical Memorandum for No Further Action - Potential Source of Contamination 44, Ditch from DRMO to Wastewater Treatment Plant. NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, January.

TtNUS, 2002b. Engineering Evaluation/Cost Analysis (EE/CA) for Operable Unit 12, Site 32, DRMO Asphalt Storage Yard. NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, August.

TtNUS, 2003. Proposed Plan for Operable Unit 12, Site 32. NAS Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina, June.

U.S. EPA (United States Environmental Protection Agency), 1995. Supplemental Guidance for RAGS: Region IV Building, Human Risk Assessment. U.S. EPA Region IV Waste Management Division, Atlanta, Georgia. November.

U.S. EPA, 1999. A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents. Office of Solid Waste and Emergency Response (OWSER) 9200.1-23P. EPA Document 540-R-98-031. July.

U.S. EPA, 2000a. Region IV Ecological Risk Assessment Bulletins - Supplement to RAGS. Waste Management Division, Atlanta, Georgia, March.

U.S. EPA, 2000b. Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities, and Inclusion of Stakeholders. Memorandum from Ted W. Simon, Region IV EPA Office of Technical Services, Atlanta, Georgia, June.

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Public notice of the availability of the Proposed Plan was placed in the Metro edition of the *Florida-Times Union* on September 24, 2003. This local edition targets the communities closest to NAS Cecil Field. A 30-day public comment period was held from September 24 to October 24, 2003. Provisions for the public to request a public meeting to discuss the Revised Proposed Plan were also described in the public notice. No comments were received during the 30-day comment period.

APPENDIX B

ESTIMATED COSTS OF SELECTED REMEDY

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
SITE 32
ALTERNATIVE 2: INSTITUTIONAL CONTROLS AND MONITORING

Item	Quantity	Unit	Unit Cost Subcontract	Unit Cost Material	Unit Cost Labor	Unit Cost Equipment	Extended Cost Subcontract	Extended Cost Material	Extended Cost Labor	Extended Cost Equipment	Subtotal
1 PROJECT PLANNING											
1.1 Prepare Monitoring Plan	20	hr			$35.00		$0	$0	$700	$0	$700
2 INSTITUTIONAL CONTROLS											
2.1 Prepare Deed Restrictions & LUCs	150	hr			$35.00		$0	$0	$5,250	$0	$5,250
Subtotal							$0	$0	$5,950	$0	$5,950
Local Area Adjustments							100.0%	120.5%	88.0%	88.0%	
							$0	$0	$5,236	$0	$5,236
Overhead on Labor Cost @ 30%									$1,571		$1,571
G & A on Labor Cost @ 10%									$524		$524
G & A on Material Cost @ 10%								$0			$0
G & A on Subcontract Cost @ 10%							$0				$0
Total Direct Cost							$0	$0	$7,330	$0	$7,330
Indirects on Total Direct Cost @ 35%											$2,566
Profit on Total Direct Cost @ 10%											$733
Subtotal											$10,629
Health & Safety Monitoring @ 0%											$0
Contingency on Subtotal Cost @ 0%											$0
Engineering on Subtotal Cost @ 0%											$0
TOTAL COST											**$10,629**

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
SITE 32
ALTERNATIVE 2: INSTITUTIONAL CONTROLS AND MONITORING
Annual Cost

Item	Item Cost Annually	Item Cost Every 5 Years	Notes
Sampling		$3,150	Labor, Field Supplies
Analysis/Water		$500	Analyze samples from two (2) locations plus one (1) QA sample for TCL VOCs, TCL SVOCs, and TCL Metals/CN
Report		$1,200	Document sampling events and results
Site Inspection	$1,000		To verify continued implementation of the LUCIP.
Site Review		$7,000	
TOTALS	$1,000	$11,850	

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
SITE 32
ALTERNATIVE 2: INSTITUTIONAL CONTROLS AND MONITORING
Present Worth Analysis

Year	Capital Cost	Annual Cost	Total Year Cost	Annual Discount Rate at 7%	Present Worth
0	$10,629		$10,629	1.000	$10,629
1		$1,000	$1,000	0.935	$935
2		$1,000	$1,000	0.873	$873
3		$1,000	$1,000	0.816	$816
4		$1,000	$1,000	0.763	$763
5		$12,850	$12,850	0.713	$9,162
6		$1,000	$1,000	0.666	$666
7		$1,000	$1,000	0.623	$623
8		$1,000	$1,000	0.582	$582
9		$1,000	$1,000	0.544	$544
10		$12,850	$12,850	0.508	$6,528
11		$1,000	$1,000	0.475	$475
12		$1,000	$1,000	0.444	$444
13		$1,000	$1,000	0.415	$415
14		$1,000	$1,000	0.388	$388
15		$12,850	$12,850	0.362	$4,652
16		$1,000	$1,000	0.339	$339
17		$1,000	$1,000	0.317	$317
18		$1,000	$1,000	0.296	$296
19		$1,000	$1,000	0.277	$277
20		$12,850	$12,850	0.258	$3,315
21		$1,000	$1,000	0.242	$242
22		$1,000	$1,000	0.226	$226
23		$1,000	$1,000	0.211	$211
24		$1,000	$1,000	0.197	$197
25		$12,850	$12,850	0.184	$2,364
26		$1,000	$1,000	0.172	$172
27		$1,000	$1,000	0.161	$161
28		$1,000	$1,000	0.150	$150
29		$1,000	$1,000	0.141	$141
30		$12,850	$12,850	0.131	$1,683
				TOTAL PRESENT WORTH	$48,587